Name: _____ Date: _____

Culminating Task: Family Outing

MCC9-12.A.REI.1 Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method.
MCC9-12.A.REI.3 Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.
MCC9-12.A.REI.5 Prove that, given a system of two equations in two variables, replacing one equation by the sum of that equation and a multiple of the other produces a system with the same solutions.
MCC9-12.A.REI.6 Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables.
MCC9-12.A.REI.12 Graph the solutions to a linear inequality in two variables as a half-plane (excluding the boundary in the case of a strict inequality), and graph the solution set to a system of linear inequalities in two variables as the intersection of the corresponding half-planes.

You and your family are planning to rent a van for a 1 day trip to Family Fun Amusement Park in Friendly Town. For the van your family wants, the Wheels and Deals Car Rental Agency charges $25 per day plus 50 cents per mile to rent the van. The Cars R Us Rental Agency charges $40 per day plus 25 cents per mile to rent the same type van.

1. Write a mathematical model to represent the cost of renting a van from the Wheels and Deals Agency for 1 day.

    a. Do the units matter for this equation?

    b. Use the equation to determine the cost for renting the van from this agency for 1 day and driving 40 miles.

2. Write a mathematical model to represent the cost of renting from the Cars R Us Agency for 1 day.

    a. Do the units for this equation match the units for the equation in problem 1? Does this matter when comparing the 2 equations?

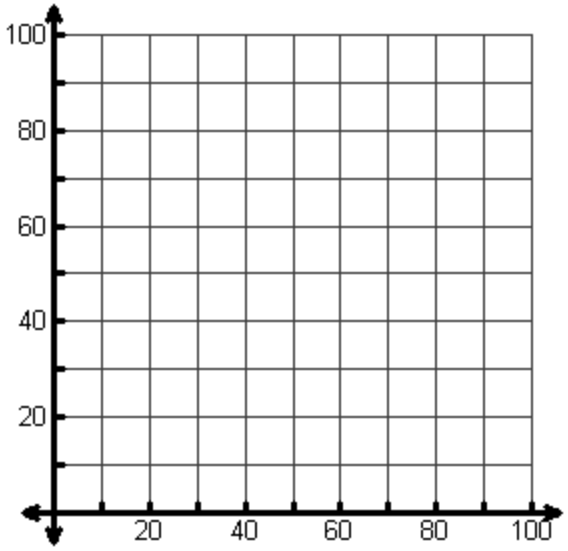
    b. Use the equation from '2a' to determine the cost for renting the van from Cars R Us for 1 day and driving 40 miles.

3. Graph the 2 models on the same coordinate system. Be sure to extend the lines until they intersect.
    a. Where do the 2 lines intersect?

    b. What does the point of intersection represent?

    c. When is it cheaper to rent from Wheels and Deals?

    d. When is it cheaper to rent from Cars R Us?



4. Friendly Town is approximately 80 miles from your home town. Which agency should you choose? Justify your answer.

When you leave the car rental agency, your father goes to the Fill 'er Up Convenience Store for gas. The gas hand indicates the van is on empty, so your father plans to fill the tank. Gas at the station is $3.49 per gallon.

5. If your father spends $78 on gas, approximately how many gallons did he purchase?

While in the store, your father purchased drinks for the six people in your van. Part of your family wants coffee and the rest want a soda.

6. Coffee in the store costs $.49 per cup and sodas are $1.29 each. The cost of the drinks before tax was $6.14.

    a. Write a mathematical model that represents the total number of cups of coffee and sodas.

    b. Write a mathematical model that represents the cost of the coffee and soda.

    c. Solve the system of equations using the elimination method.

When you arrive in Friendly Town at the Family Fun Amusement Park, the 6 people in your family pair up to enter the park. You and your brother decide to enter and ride together. The cost to enter the park is $10, with each ride costing $2.

7. You bring $55 to the park. You must pay to enter the park and you budget an additional $10 for food. Write and solve an inequality to determine the maximum number of rides you can ride. Explain your answer.

8. Your brother brings $70 to the park and budgets $12 for food. How many more rides can he ride than you? Explain your answer.

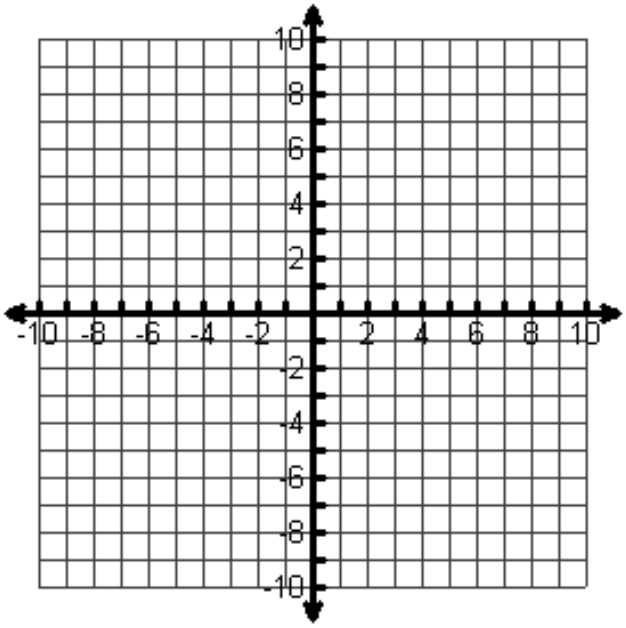
Inside the park, there are 2 vendors that sell popcorn and cotton candy. Jiffy Snacks sells both for $2.50 per bag. Quick Eats has cotton candy for $4 per bag and popcorn for $2 per bag.

9. If you use the $10 you budgeted for food, write an inequality to model the possible combinations of popcorn and cotton candy you can purchase from Jiffy Snacks.

10. Write an inequality to model the possible combinations of popcorn and cotton candy you can purchase from Quick Eats.

11. Graph the system of inequalities. Give two combinations that work for both vendors.

12. Assuming you purchase at least one of each, what is the maximum number of bags of cotton candy and popcorn that work for both equations?



When you leave the park, your father notices that you have used ¾ of the tank of gas you purchased before you left.

13. Do you have enough gas to get home? Justify your answer.

14. Your father wants to purchase enough gas to get home, but not leave extra in the tank when the van is returned to the rental agency. Approximately how many more gallons should he purchase? Justify your answer.